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ABSTRACT

The irregularity of English spelling rules, dialect differences, and an inability to identify sound segments within a single syllable are three important reasons teachers and students have difficulty teaching and learning reading using phonics. Within the same language, phonics rules may need to be adapted to fit the dialect of the student or of the teacher. Also, most sequences of sounds are not distinct sounds but are blends and sounds affected by their neighboring sounds. This is as true of consonant-vowel or vowel-consonant sequences as it is of consonant-consonant sequences. Although an adult native speaker of a language may be conscious of utterances as strings of discrete segments of sound, the phonetic reality is a continuous stream of sound in which it is not often possible to find breaks or dividing lines between one sound and another. Programs that teach decoding rules in terms of whole syllables avoid the problems children may have in consciously analyzing syllables into abstract segments. (TJ)

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Why Phonics is So Difficult for Children (and Teachers): A Linguistic View

Discussions of the irregularities of the English spelling system, and the problems they cause in phonics instruction, have become commonplace in the literature. Teachers are well aware of the fact that letter-sound correspondence is not a one-to-one proposition in English, and the many exceptions to phonic "rules" have been well documented over the years. (See Clymer, 1; Dzama, 2; and Bailey, 3.) For example, Bailey (3) points out that the generalization "When there are two vowels side by side, the long sound of the first vowel is heard, and the second vowel is usually silent" (p. 415) has a utility of only 34%, and the generalization "When y is used as a vowel in words, it sometimes has the sound of long i" (p. 416) has a utility of only 11%. Many teachers believe that if only English spelling were phonetically more regular, children would be able to learn phonics easily. This belief tends to overshadow the fact that there are more fundamental problems inherent in phonics instruction for beginning readers. This discussion will focus on two problem areas which exist even for spelling systems in which there is a more regular correspondence between phoneme and grapheme: (1) dialect

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differences and (2) identification of sound segments within a single syllable.

Dialect Differences

English, like other languages, is in effect not "one language" but rather a large set of languages or dialects that have much in common with each other, but many differences among them as well. Our notion of English as being a single language is in part based on the fact that where the dialects contain the same vocabulary, the words are generally spelled in the same way, regardless of differences in the way they are pronounced. Note that, ironically, where spellings are different in America and Britain, such as check - cheque, center - centre, honor - honour, the spelling differences do not correspond to actual pronunciation differences. Thus, with few exceptions, all the English speaking world spells the same words the same way.

The term "code" is sometimes used to express the regular relationship between spelling and pronunciation. But if a single spelling corresponds to more than one pronunciation, such as for the spelling fog or cart, then there must be more than one "code" which matches spelling to sound. If a reader is to decode from spelling to pronunciation, he needs to use the particular code which is appropriate to his own dialect. Consider, for example, the English spellings erry (merry, ferry, berry), arry (marry, carry, Harry), airy (hairy, fairy, dairy), ary (Gary, Mary, wary), and urry (furry, Murray, hurry).

For the native Chicagoan (such as Geissal), the spellings erry, arry, airy, and ary represent identical pronunciations

[ɛri]. (Thus the first 12 words above all rhyme, and the words Mary, marry, merry are homophones.) The spelling urry has a different pronunciation [əri].

For the native Philadelphian (such as Knafle), the spellings erry and urry represent one pronunciation [əri], and the words hurry and merry rhyme. The spelling arry represents a second pronunciation [æri], the spelling airy a third pronunciation [ɛri], and the spelling ary sometimes represents the same sound as arry (Gary) and sometimes the same sound as airy (Mary).

The New Yorker has four distinctions: erry [ɛri], arry [æri], airy [eri], and urry [əri], with ary rhyming sometimes with airy (as in the pronunciation of Mary) and sometimes with arry (as in the pronunciation of Gary).

To decode the spellings in question into his own pronunciation, the Chicagoan follows the rule that airy, ary, erry, and arry spell the same sound; the Philadelphian associates one sound with urry and erry, another with airy, a third with arry, and ary is variable; the New Yorker associates a different pronunciation with each different spelling except for ary which again is variable.

Similar situations arise in most written languages, even in Spanish, which is generally supposed to have a very regular spelling system. For example, the word cocer (to cook) is spelled the same way in Spain and in Mexico, but in Mexico, cocer is pronounced exactly the same way as the verb coser (to sew), while in Spain the two words are pronounced differently. The letter c represents the [s] sound in the Mexican dialect of Spanish, but in Castillian

Spanish c represents the [θ] sound (i.e. the first sound in thin).

A reader who correctly applies a set of decoding rules to arrive at pronunciations which are not in his own speech must take the additional step of translating from the dialect of the phonics rules to his own dialect. For example, the Chicagoan following Philadelphia's rules will derive [mɛri] (Murray) from the spelling merry, and then must translate that pronunciation to [mɛri] (a homophone of marry and Mary in his speech). This procedure is at best inefficient, and at worst a source of confusion. When the reader has had very limited exposure to the particular dialect of the instructional phonics materials, he finds that the unsuitable code not only fails to reveal the identify of the printed word, but it obscures the word by providing false information about it. Thus the decoding process itself can be a cause of unnecessary frustration.

Teacher's manuals frequently point out the fact that adaptation of phonics materials is necessary to accommodate dialect variation. However, a child is often taught that a letter "has" a sound. If the child produces a different sound in response to the letter, then, by implication, the child is in error, even though the child may be perfectly correct in assigning the appropriate sound-symbol correspondence from his own dialect. The child who speaks Black English Vernacular may respond with an [f] sound to the digraph th when it occurs at the end of a word. In his dialect, of course, the digraph th does indeed represent the sound [f] in such words as tooth, Ruth, with, etc., as he pronounces them. The situation for the child is no different from the situation of a Chicagoan in a

Philadelphia classroom who produces [ɛri] when he sees erry (in contrast, presumably, to the Philadelphian teacher).

Typically the adjustment of phonics rules to meet the variety of Standard English dialects is made quite readily by teachers, who themselves usually speak the standard dialect of the region. A primary teacher who moves from one region to another may find that his dialect is quite different from that of the pupils and their parents. If he attempts to teach the phonics rules of his own dialect, he may experience considerable difficulty with pupils, parents, and administrators. So the teacher, not the pupils, must make the necessary adjustments.

When the dialect spoken by the children is not a regional standard, however, but a non-standard variety associated with lower socio-economic groups, teachers may be unwilling to accept the necessity for matching phonics rules to "unacceptable" speech. Nevertheless, if a child does not distinguish in his speech between such pairs as doze and those, or tree and three, the appropriate phonics rule, for him, is that the digraph th at the beginning of a word represents the sounds [d] or [t]. For the child for whom the pairs told and toll, cold - coal, build - bill, and well - weld are homophones, the appropriate rule is that the digraph ld at the end of a word represents the l sound: [l].

The question of whether, or when, children should be taught to use Standard English pronunciations is quite a different issue on which there seems to be no consensus among either linguists or educators at this time. (See Somervill, 4.) There is a consensus on the purpose of phonics instruction: to provide the

reader with a tool to figure out, by himself, how a word sounds on the basis of its spelling. (See, for example, Durkin, 5, 6, and Lamb, 7.) If the phonics rules the child learns match his own language, his success in learning and using phonics is quite independent of his success in acquiring Standard English. It is only when Standard English phonic rules are taught that the prior success of the child in learning Standard English becomes a factor in determining how well he can use phonics.

Of course readers have other clues about what the print says besides decoding rules. They have such things as grammatical structure, context, experience, and sight vocabulary to help them. Children can, and do, compensate for the inadequacies of the decoding rules they have been taught with other reading strategies. But the fact that children often do compensate does not change the fact that learning the wrong code is a hindrance rather than a help to them. And rather than more drill on the inaccurate (for them) phonics rules, it would seem they need either accurate phonics rules or more instruction and practice in the compensatory strategies.

Dividing Syllables into Segments

Beyond the problems deriving from dialect differences, a more basic issue arises with regard to tests and exercises which require the child to identify individual sound segments within a single syllable. Such tasks as determining whether a sound (more correctly, a segment) occurs at the beginning, middle, or end of a syllable, or whether two syllables begin with the same segment requires a conscious awareness of structures which exist only

abstractly, and not physically at all.

Consider first the phenomena known as "consonant blending." It has long been recognized in phonics instruction that when words begin with a sequence of two or more consonants the sounds of those consonants are "blended"; that is, the consonant sounds have somewhat different pronunciations than they would if they occurred singly with vowels. For example, compare the words pray, ray and spray. The p in pray is aspirated; the p in spray is not. The r in pray is voiceless, but the r's in ray and spray are voiced. Most adults who are untrained in phonetics have difficulty hearing the difference between the two kinds of p and the two kinds or r. Nevertheless, the differences are physically present (and visible on a sound spectrogram). The adult's perception of the r and p sounds in these words is based on his awareness of abstract entities: the /r/ and /p/ phonemes. (A concept parallel to the concept of a phoneme is represented by the term grapheme. Thus the g grapheme has many variants, or allographs, such as g, G, and g.) So the different ways that r is pronounced are thus allophones of the (abstract) phoneme /r/.

The "blending" of consonants when they occur in clusters is just the sort of thing that happens to most sequences of sound segments in the same syllable. Sounds are affected by their neighboring sounds, and this is just as true of consonant-vowel or vowel-consonant sequences as it is of consonant-consonant sequences. So the f in foot is produced with the lips rounded because the following vowel is rounded, but the f in feet is produced without rounding. And we say the /f/ phoneme has a

round variant and an unround variant. If we examine the physical properties of speech, we can see that virtually every syllable in English is in fact a "blend."

We have noted the fact that a phoneme in a language is an abstract concept, and that each phoneme may be represented by a variety of sound segments, the occurrence of a specific variant depending on the other segments in the word. The rules of each particular language determine what the phonemes of that language are. The rules also determine what segments occur as allophones of each phoneme, depending on the position of that phoneme in a word and the identity of the surrounding phonemes (see Geissal and Knafle, 8). The word pray can be considered a sequence of the three phonemes /p/, /r/, and /e/. But since each phoneme is an abstract entity, represented in any given word by the appropriate allophone, the word pray can also be considered a sequence of the three allophones [p^h] (aspirated), [$\underset{\circ}{r}$] (voiceless) and [$e:^i$] (lengthened and diphthongized). But the allophone is also an abstraction. Since no one can ever say the same word exactly the same way twice, the allophone is really a general kind of sound segment. More importantly, the allophone is a sound segment-- a piece of a syllable. Now we turn to the concept of sound segment and discover that segments, too, are abstract structures.

Although an adult native speaker of a language may be conscious of utterances as strings of discrete, or separate, segments of sound, the phonetic reality is a continuous stream of sound in which it is not often possible to find breaks or dividing lines between one sound and another. Our perception of speech is in fact an analysis of the physically continuous stream into abstract

segments based on our knowledge of the language. Experiments with speech synthesis have shown that in a syllable like bag "...the influence of the initial and final consonants extend so far into the vowel that they overlap even with each other, and that the vowel influence extends throughout the syllable" (Cooper, 9, p. 28). Figure 1 provides a visual example of the way in which the segments in a consonant-vowel-consonant (CVC) syllable are "blended."

... Insert Figure 1 here ...

English speakers, for example, perceive the word camp as a sequence of four segments or separate sounds. The third segment would be, of course, m. The m sound is typically made by closing the lips and humming through the nose. But in the word camp as it is usually produced in normal English speech, there is in fact no instant at which there is simultaneous lip closure and humming, that is, no point at which m, as in mother, is actually produced. What we perceive as the m segment is really a change in the vowel sound, so the vowel is similar to the vowel in the French word vin.

Now consider the two words Kay and pay. Again, we cannot physically isolate either a k "sound" or a p "sound" in these words since they are not sounds at all, but complete closures or interruptions in the stream of speech. We can distinguish Kay and pay only because the very first part of the vowel in each word is different. (Note that because the /k/ and /p/ phonemes are represented by their aspirated variants in these words, the very first part of the vowel in each case is voiceless or whispered.) And in the words ache and ape, the complete closure comes at the end of the words; the two words are distinguished because the

quality of the very end of the vowel in each is different.

Therefore, the word camp consists physically only of a continuously changing vowel sound, the beginning of which is a result of modifying the target vowel[æ]to indicate a a k closure (as well as aspiration), the middle of which is nasalized (i.e., perceived as a following m sound), and the end of which is modified to show a final p closure.

Now suppose we have the two words key and Kay. As before, there is no k sound, just a modification of the beginning of the vowel. But this time the vowels in the two words are different, so the first part of the vowel sound is also different. Physically, then, these words do not begin with the same sound. Only to a listener who can consciously perceive at the level of abstract segments will these words begin with the "same sound." A child who is not yet conscious of his own perceptual analysis of the words key and Kay into separate segments may not be able to state that key and Kay begin with the "same sound." Further, only a listener who is consciously aware of the phonemes of his language (though of course he may not know the term phoneme) can recognize that the first sound in the word ray is the same as the second sound in pray.

Unfortunately, there is no direct method to teach a child to attend to something--a segment or a phoneme--which has no existence outside of his own brain. One can't point to it, or pronounce it (one can only produce a non-discrete acoustic signal), or highlight it, or compare it with other phenomena, etc. It may be that it cannot be taught at all, but must arise maturationally.

There is some evidence that a mental age of at least seven is required to analyze the spoken syllable into segments (see Bruce, 10). There is, unfortunately, little substantial understanding on this question by linguists. Reading teachers have long been aware, however, of the problem some children have in sound blending. These children have not attained awareness of the abstract segment; they produce full syllables corresponding to each segment. They say puh - eh - tuh (three syllables) for pet. Of course they cannot ever, nor can anyone, produce many of the segments of English in isolation--the stops p, t, k, b, d, g, in particular. A child attempting to produce the "p sound" must necessarily produce a full syllable, like puh, or s/he can produce no sound at all. And, of course, the task of putting the three syllables together into the single syllable pet is not a matter of speed. (No matter how fast you can say three syllables, they never equal one syllable.) To date, the evidence is unclear as to the effectiveness of sound blending training for children who cannot identify sound segments within a single syllable. Although some studies have attempted to investigate this kind of training, such confounding factors as reading ability, prior knowledge, and maturational level have tended to obscure the findings. It may very well be that "when the teacher asks the child to blend such units (to pronounce the sounds in such a way as to obliterate the demarcation line between them), this is in some ways tantamount to asking the child to 'know how to read'" (Gleitman and Rosin, 11, p. 457).

Even though much of the process of perceiving segments is unclear to linguists, it is quite clear that perceiving segments

is not a matter of hearing correctly, or listening carefully. Training methods which imply that this is the case risk high levels of confusion and frustration in pupils who are already listening very well. Thus, a problem frequently arises when a child says that a given pair of words does not have the same vowel sound, and the teacher says, "Listen more carefully next time." However, the child may already be listening more carefully than the teacher. An analogous situation would be if a child were shown two objects of different shades of red. The teacher asks if the objects are the same color. When the child replies, "No," the teacher says, "Look more closely next time." The closer the child looks, the more different the colors obviously are.

Teachers who find it difficult to discriminate the variants of a phoneme (the voiced [r] in ray vs. the voiceless [r] in pray, for example) may assume that this task is at least as difficult for children. But the opposite may be the case. Children may be much closer to phonetic reality than adults. It is certainly true that children who learn a second language when they are young can come to speak the language with great phonetic accuracy--without an accent. Adults who learn a second language, on the other hand, usually maintain some imperfections in their pronunciation throughout their lives. What children may find difficult are the tasks the adult takes completely for granted--breaking a syllable into segments and consciously identifying different sounds as manifestations of the same phoneme.

It should be noted that not all phonics advocates approach the teaching of phonics in terms of single sounds (see Dechant, 12, and

Groff, 13, for example). Programs which teach decoding rules in terms of whole syllables avoid the problems that children may have in consciously analyzing syllables into abstract segments. Such programs, of course, require the same adaptation for dialect differences, just as other phonics programs do.

It seems to us, in light of the language facts we have discussed, that the most desirable way to teach phonics is a whole-syllable approach which is adapted to match the dialect of each individual child. This approach, however, is often difficult given the fact that the children in an urban classroom frequently do not all speak the same dialect. Indeed, an urban teacher may hear several dialects spoken in the same classroom. Adaptation to dialect differences--which requires first of all a thorough understanding of the dialects--is very difficult in these circumstances. Fortunately, other reading strategies are available to these children, and teachers should be prepared to compensate for difficulties in the phonics approach with added emphasis on such strategies as the use of language experience stories, context clues, sight vocabulary, etc.

We hope that our discussion will help classroom teachers to anticipate and understand the basic difficulties that they and their students may have with phonics: that dialect differences may render particular phonics rules inappropriate for particular children, and that not all children will have reached a conscious awareness of the abstract linguistic units of their language. In particular, a child may be unaware of the segmentation of syllables, and s/he may not be able to identify the units called phonemes.

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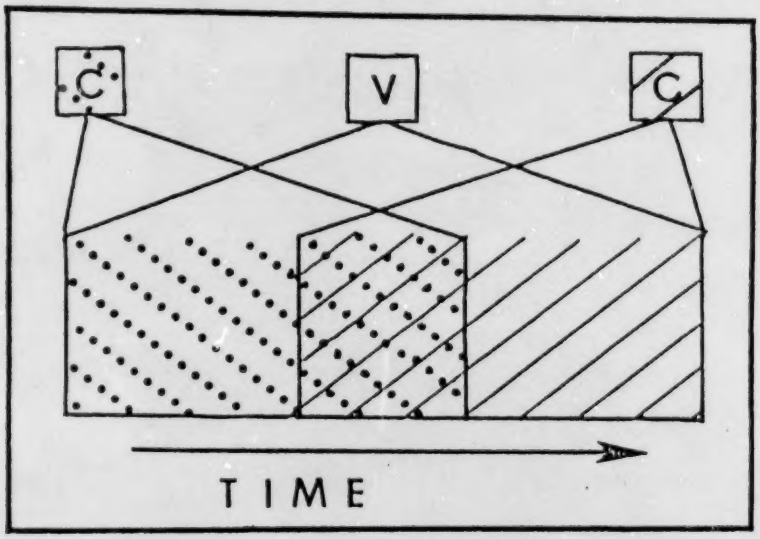

Figure 1. Overlapping of segments in a consonant-vowel-consonant (CVC) syllable.